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ABSTRACT

The competencies necessary for entry and advancement in cotton production were determined by surveying people in the cotton production industry from nine of the ten leading cotton producing states. A preliminary listing of competencies was developed from a review of the literature and from a survey of specialized personnel in soil and crop sciences. The 43 respondents, identified by state directors of agricultural education, rated each specific competency for cotton production in terms of the relative importance associated with employability at the entry and first advancement levels. Responses were summarized in table form, indicating the number of responses for each degree of relative importance, the number of people not responding, and the weighted mean for each duty and specific and general competency. The relative importance of 158 specific competencies and two general competencies for cotton production were rank ordered with the weighted mean given for each. Appendixes contain membership lists of advisory and validating committees, the number of respondents from the ten leading cotton producing states, a rank order of cotton production duties with component general competencies rank ordered within the duty, and a cotton production employee job description. (NJ)

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EMPLOYMENT OPPORTUNITIES AND TRAINING NEEDS IN AGRIBUSINESS

COMPETENCIES FOR COTTON PRODUCTION

THE DEPARTMENT OF AGRICULTURAL EDUCATION

TEXAS A&M UNIVERSITY

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NATIONAL INSTITUTE OF EDUCATION

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Substancial funding for this project was supplied by Texas Education Agency through its Division of Occupational Research and Development in a contract with Texas A&M University, Project No. 52350152.

Concurrent work in competency identification for agribusiness is in progress in other states in a coordinated national effort. Information concerning the coordinated effort may be secured from Dr. David R. McClay, Professor Emeritus, Department of Agricultural Education, the Pennsylvania State University, University Park, Pennsylvania 16802, who serves as chairman for the national effort, or from H. Neville, Hunsicker, Office of Education, U.S. Department of Health, Education, and Welfare, Washington, D.C. 20202.

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THE NATIONAL EFFORT

A national committee made up of representatives from four federal departments addressed itself in 1968 to defining and identifying agribusiness occupations and the industries in which they are located. This effort involved the cooperation of many individuals within the four departments, from many of the states and from the private sector industries involved in agribusiness.

Six years later, in September, 1974, the effort resulted in the publication by the Economic Research Service of the United States Department of Agriculture an ERS 570 series entitled EMPLOYMENT IN AGRICULTURE AND AGRIBUSINESS OCCUPATIONS. The base data employed were those of the 1970 Census of Population of the U.S. Bureau of the Census. The eight categories of competencies in use by the U.S. Office of Education were utilized to identify those occupations and industries requiring agricultural competence. The agribusiness sector thus identified consisted of 108 occupations and 201 industries from the CLASSIFIED INDEX OF INDUSTRIES AND OCCUPATIONS of the Bureau of the Census.

The national committee identified six major objectives. One of those was to "Identify skills, competencies and training needed for current and future employment in agribusiness occupations." As an approach to this formidable task, representatives of agricultural education of the nation met in Columbus, Ohio in May, 1974 where each state represented was requested to accept responsibility for competency identification for one or several of the occupations previously identified.

Texas accepted responsibility for competency identification in the production of cotton and the production of horses. This document is a part of the work done in the discharge of that responsibility.

THE PROJECT STAFF

While four staff members of the Department of Agricultural Education of Texas A&M University participated formally in the work herein reported, it should be noted that sustained daily effort and much of the project detail were performed by William E. Hudson, Research Associate for the project.

The project staff wishes also to identify additional internal support efforts from Dr. Earl H. Knebel in administering the project, from Dr. Earl S. Webb in his function as research coordinator for the Department, from Dr. Jay Grimes in the area of identification and statement of competencies, and from graduate assistant Richard Montgomery and graduate fellow Donald Henson for valuable assistance during peak activity periods.

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.....Nine state directors of agricultural education in other states for assistance in identifying appropriate personnel for national validation.

.....Members of two advisory committees representing the industry for services without compensation to identify and to validate competencies for Texas. Members are listed elsewhere in this publication.

.....Representatives of the industry in nine states other than Texas for examining and responding to listings of competencies in the process of national validation.

INTRODUCTION

Rapid redirection of programs of agricultural education is in progress in the United States. A realization of the need for educational programs to provide manpower requirements for all occupations requiring agricultural competence is rapidly being translated into programs and curriculums to meet the needs without regard to the location of the occupation. It has been established that agricultural competence is required in 201 industries rather than five bearing upon agriculture production, forestry and fisheries. At the same time, educational planners accept identification and analyses of the competencies required in each occupation to be a viable approach to curriculum development.

So vast was the need for competency identification in the occupations and industries identified by a national study and published in August, 1974 by the Economic Research Service of the United States Department of Agriculture* that it was quickly apparent that no one school system nor indeed one state could accomplish the entire mission. Beginning in June, 1973 planning began to distribute the responsibility among the several states, and in May, 1974 at a national meeting in Columbus, Ohio, a majority of the states of the nation accepted responsibility for specific competency identification.

Representatives from Texas accepted responsibility for competency identification in the production areas of cotton and horses.

*Employment in Agricultural and Agribusiness Occupations, Economic Research Service, United States Department of Agriculture, in cooperation with Bureau of the Census, U.S. Department of Commerce; Office of Education, U.S. Department of Health, Education and Welfare and Manpower Administration and Bureau of Labor Statistics, U.S. Department of Labor; Series ERS-570; August, 1974.

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Purpose of the Study

The primary purpose of this study was to determine from industry the competencies necessary for entry and advancement in cotton production. A secondary purpose was to interpret data from Texas and national manpower studies with implications for program planning in agricultural education which includes up-dating of training and employment needs in Texas Agribusiness. The results should lead to better knowledge of the competencies that should be taught in vocational agriculatue programs involved in training students for employment in cotton production. Results of interpretation of manpower data would provide more realistic estimates of the demand for employees that need agricultural skills and competencies to perform their job. In order to achieve these purposes the following specific objectives were developed as guidelines for conducting the research:

1. Identify competencies in cotton production required at the entry and first advancement levels of employment.

2. Refine and validate competencies in cotton production.

3. Enterpret data on employment and training needs in agribusiness.

4. Up-date the employment and training needs in Texas agribusiness from data supplied by USOE, U.S. Department of Agriculture, U.S. Department of Labor, and the U.S. Bureau of the Census through the National Committee on Employment and Training Needs in Agribusiness.

5. Publish a final report for submission to the Texas Education Agency and disseminate copies to states through reciprocity.

Definition of Terms

To facilitate understanding and utilization of the findings of this study, the following definitions were used:

Duty - A large segment of work performed by an individual. It is one of many major activities performed as part of a job. Each duty is made up of several segments. An example of a duty is "controlling insects".

General Competency - A major subdivision of a duty. An example of a general competency is "determine the degree of insect threat".

Specific Competency - A subdivision of a general competency. This is usually a discrete work unit having a specific beginning and ending point. An example of a specific competency is "identify mature and immature forms of harmful and beneficial insects".

Basic Assumptions

The following basic assumptions were made in planning and conducting the study:

1. Members of the advisory and validating committees were representative of the cotton production industry.

2. Respondents for the national validation phase were representative of the cotton production industry.

3. Specific competencies are fundamental elements used in developing a curriculum for cotton production.

4. Specific competencies are logical parts of a general competency.

5. General competencies are logical parts of a duty and are useful as a means of grouping specific competencies.

6. Duties listed are logical subdivisions of the cotton production industry and are useful for grouping general competencies.

Limitation

The findings of this study were subject to the following limitation: The study was limited to the information obtained from responses on question-

aires from producers in 9 of the ten leading cotton producing states.

Research Procedure

The review of relevant literature through use of a computer search initiated the project. The citations of (1) the Bibliography of Agriculture from the National Agriculture Library and (2) the Research in Education, Current Index to Journals in Education, and the Abstracts of Instructional Materials subfiles of the Educational Resources Information Center of the National Institute of Education were reviewed by computer search. Leaders in agricultural education were surveyed by letter to locate relevant material not included in the computer search. Copies of useful material were obtained for review and possible inclusion in the competency list.

Specialized personnel in the Department of Soil and Crop Sciences assisted with developing the preliminary listing of competencies for cotton production. Specialists in cotton production met with project personnel to discuss competencies to be included in the competency list. The experience and expertise of the selected specialists and the input from the literature were combined to formulate a competency list for cotton production.

Staff members of the Agricultural Education Division, Texas Education Agency, identified several people who were qualified to serve on the advisory and validating committees for cotton production. Advisory committee members (Appendix A) were selected from the list of nominees and met once on the Texas A&M University campus to evaluate the competency list. The advisory committee added some competencies, deleted other competencies, and revised competency statements to make the preliminary list more relevant.

Following the advisory committee meeting the project staff revised the competency list and submitted it to the advisory committee members by mail for review. Additional comments and suggestions were solicited to insure

that the project staff had made revisions according to the advisory committee recommendations. The competency list was refined according to the suggestions made by the responding advisory committee members.

Members of the validation committee (Appendix A) were selected from those persons remaining on the list of nominees. The committee met on the Texas A&M University campus for validation of the refined competency list for cotton production. The validating committee reviewed the list and made suggestions for improvements. Committee members were asked to rate each specific competency for cotton production in terms of relative importance associated with employability at the entry and first advancement levels of employment.

The project staff incorporated the suggested changes into the competency list and compiled results of the relative importance judgements. These were then mailed to members of the validating committee for additional comments. The final draft of the competency list used for the national validation phase resulted from utilizing the suggestions made by the validation committee members.

State directors of agricultural education in 9 of the ten leading states in cotton production (Appendix B) were asked to identify for each state ten outstanding members of the cotton production industry to serve as a national validation committee. Questionaires were mailed to those people so identified. Nonrespondents were sent a followup letter urging them to complete the survey. Those not responding to the followup were sent another questionaire and were again asked to complete and return the instrument.

Forty-three people in the cotton production industry from nine states other than Texas returned questionaires. The respondents rated each specific competency for cotton production in terms of the relative importance associated with employability at the entry and first advancement levels of employment.

The degree of relative importance and definitions for each as approved by the National Committee for Identifying Competencies in Agricultural Occupations follow:

Essential - Of utmost importance; competence in performing this task is absolutely necessary for entry level employment.

Important - Competence in performing this task has much influence or effect on employability.

Of Some Importance - Competence in performing this task has some influence on employability.

Not Important - Competence in performing this task has no effect on employability.

Does Not Apply - Task does not apply to the occupation cluster.

A 5 point scale was used to score the respondents' responses. The scale used for tabulation was:

4 = essential

3 = important

2 = of some importance

1 = not important

0 = does not apply

A weighted mean was then calculated for each specific competency to help determine the overall relative importance of each competency. The highest possible weighted mean was 4.00 with the lowest possible weighted mean being 0.00. The weighted mean was calculated from the responses of respondents who actually checked a degree of relative importance for specific competency statements.

The weighted mean for each general competency was calculated by summing the scores for the specific competencies and dividing by the sum of respondents for the specific competencies constituting the general competency. Likewise,

the weighted mean for each duty was calculated by summing all scores for specific competencies and dividing by the sum of respondents for the specific competencies constituting the duty. Appendix A lists the duties in rank order with the component general competencies rank ordered within each duty.

Findings

Table No. 1, page 7, summarizes responses of forty-three people in the cotton production industry from 9 states other than Texas. Noted on the table are the number of responses for each degree of relative importance, number of people who did not respond, and the weighted mean for each duty, general competency, and specific competency. Due to a deficiency in the questionaire instructions, which apparently implied to some respondents that only specific competencies should be marked, too few people responded to the duty and general competency statements to provide meaningful data. Therefore, the data presented for general competencies is an extrapolation of all responses for the specific competencies constituting the general competency. The data presented for each duty is, likewise, an extrapolation of all responses for the specific competencies comprising the duty.

Specific competencies are fundamental elements used in developing a curriculum for cotton oroduction. It is essential, then, that curriculum developers incorporate those competencies deemed most important to employability into the curriculum. The decision to include or not to include a specific competency in the curriculum is based on many inputs, one of which is the relative importance of each competency considered along with the time available for instruction.

Table No. 1. Weighted Means Derived from Responses of 43 Cotton Producers in 9 States to 5 Categories of Relative Importance for 158 Specific Competencies, *46 General Competencies*, and *15 Duties* for Cotton Production.

*Duties,** *General Competencies,*** and Specific Competencies****	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
I. Introduction	*30*	*64*	*48*	*27*	*0*	*3*	*2.57*
1. Discuss the history of cotton.	4	11	15	11	0	2	2.20
2. List the amount of production in the U.S. and the world.	5	16	13	8	0	1	2.43
3. Describe government policies that affect cotton production.	7	21	11	4	0	0	2.72
4. Evaluate opportunities in cotton production.	14	16	9	4	0	0	2.93
II. Selecting and Preparing Soil for Cotton Production	*158*	*193*	*62*	*12*	*3*	*2*	*3.15*
A. *Select the land to use.*	*46*	*58*	*18*	*5*	*1*	*1*	*3.12*
1. Recognize land possessing physical conditions, native fertility, and topography suitable for cotton production.	26	12	4	1	0	0	3.47
2. Analyze the effect the government cotton program has on land selection.	5	22	12	3	0	1	2.69
3. Develop crop rotation or crop alternation plan for soil building and for soil sanitation.	15	24	2	1	1	0	3.19
B. *Determine the time to plow land.*	*48*	*82*	*33*	*7*	*2*	*0*	*2.97*
1. Explain the influence crop residue disposal and moisture conditions has on the time to plow land.	17	20	4	2	0	0	3.21
2. Comply with legal requirements and conditions regarding disposal of crop residues.	16	16	7	3	1	0	3.00

*Duties are identified by Roman numerals. Data presented was calculated by summing all scores for those specific competencies constituting the duty.

**General Competencies are identified by capital letters. Data presented was calculated by summing all scores for those specific competencies constituting the general competencies.

***Specific Competencies are identified by Arabic numerals. Data presented is the summary of responses by the 46 respondents.

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
3. Compare and select the method of crop residue disposal.	8	23	11	1	0	0	2.88
4. Compare advantages and disadvantages of fall and spring plowing.	7	23	11	1	1	0	2.79
C. Plow the land.	*64*	*53*	*11*	*0*	*0*	*1*	*3.41*
1. Compare methods of plowing land and select the method of plowing.	15	24	3	0	0	1	3.29
2. Operate crop residue disposal equipment, plowing equipment, and power sources safely.	25	14	4	0	0	0	3.49
3. Maintain, adjust, and be able to perform field repair on crop residue disposal equipment, plowing equipment, and power sources.	24	15	4	0	0	0	3.47
III. Selecting and Using Fertilizers and Soil Amendments	*198*	*241*	*64*	*5*	*0*	*8*	*3.24*
A. Determine cotton macro and micro nutrient requirements.	*100*	*112*	*42*	*2*	*0*	*2*	*3.21*
1. List nutrient requirements for cotton production.	21	10	11	1	0	0	3.19
2. Take soil samples.	22	16	3	1	0	1	3.40
3. Interpret soil test results specifically for cotton production.	17	16	10	0	0	0	3.16
4. Compare costs of methods of fertilizer application.	14	22	7	0	0	0	3.16
5. Evaluate the effect of fertilizer placement on yield response.	13	26	4	0	0	0	3.21
6. Recognize nutrient deficiencies by visual observation of plant.	13	22	7	0	0	1	3.14
B. Compare yield results from using different sources of nutrients and soil amendments.	*9*	*20*	*7*	*1*	*0*	*6*	*3.00*
C. Plan a fertility program using combinations of nutrient sources to be applied at designated times in specified amounts.	*24*	*55*	*5*	*2*	*0*	*0*	*3.17*

(Table No. 1, Cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
1. Calculate and compare cost per unit of nutrient from available fertilizer sources.	14	25	3	1	0	0	3.21
2. Calculate the most economic combination of cotton nutrient sources.	10	30	2	1	0	0	3.14
D. Apply fertilizers.	*65*	*54*	*10*	*0*	*0*	*0*	*3.27*
1. Calibrate fertilizer application equipment.	26	13	4	0	0	0	3.51
2. Operate fertilizer application equipment and power sources safely.	22	18	3	0	0	0	3.44
3. Maintain, adjust, and be able to perform field repair on fertilizer application equipment and power sources.	17	23	3	0	0	0	3.33
IV. Selecting the Variety and Obtaining Seed	*134*	*245*	*105*	*24*	*6*	*2*	*2.93*
A. Recognize factors of variety selection.	*16*	*48*	*52*	*11*	*1*	*1*	*2.52*
1. Identify plant characteristics.	13	18	9	3	0	0	2.95
2. Identify fiber properties.	1	14	24	3	0	1	2.31
3. Explain environmental influence on fiber quality.	2	16	19	5	1	0	2.49
B. Evaluate characteristics of varieties.	*32*	*40*	*9*	*4*	*1*	*0*	*3.14*
1. Determine the varieties adapted to local conditions.	19	18	3	2	1	0	3.21
2. Compare the characteristics of locally adapted varieties.	13	22	6	2	0	0	3.07
C. Select and secure seed.	*86*	*157*	*44*	*9*	*4*	*1*	*3.04*
1. Select the variety best adapted to conditions.	26	14	2	1	0	0	3.51
2. Compare quality of cotton seed.	16	19	7	1	0	0	3.16
3. Compare advantages and disadvantages of certified, locally produced or home saved seed.	13	23	5	1	1	0	3.07
4. Describe storage methods for saved seed.	8	22	10	1	2	0	2.77
5. Evaluate the effect of seed variety on yield responses.	10	28	5	0	0	0	3.12
6. Arrange for treating and/or securing seed.	7	29	5	1	1	0	2.93
7. Explain effect of seed laws on seed selection.	6	22	10	4	0	1	2.71

(Table No. 1, cont.)

Duties,* General Competencies,* and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
V. Planting	269	273	51	7	0	2	3.34
A. Prepare seedbed for planting.	72	90	10	0	0	0	3.36
1. Describe and recognize characteristics of a cotton seedbed.	21	20	2	0	0	0	3.44
2. Compare methods of seedbed preparation.	13	29	1	0	0	0	3.28
3. Operate tillage equipment and power sources safely.	21	19	3	0	0	0	3.42
4. Maintain, adjust, and be able to perform field repair on tillage equipment and power sources.	17	22	4	0	0	0	3.30
B. Determine the time to plant on different type soils.	57	80	28	6	0	1	3.10
1. Measure soil temperature to determine time to plant.	15	20	6	2	0	0	3.12
2. Compare early and late planting.	9	27	5	1	0	1	3.05
3. Recognize moisture conditions essential at planting time.	22	18	2	1	0	0	3.42
4. Study local weather conditions.	11	15	15	2	0	0	2.81
C. Adjust planter.	140	103	13	1	0	1	3.49
1. Determine the row width for planting.	20	20	3	0	0	0	3.40
2. Determine the depth of planting in regard to environmental conditions.	28	10	4	0	0	1	3.57
3. Adjust planter to determined row width.	21	20	2	0	0	0	3.44
4. Adjust planter for depth of planting.	30	13	0	0	0	0	3.70
5. Operate planting equipment and power sources safely.	24	17	1	1	0	0	3.49
6. Maintain, and be able to perform field repair on planter.	17	23	3	0	0	0	3.33
VI. Controlling Weeds	424	397	69	11	0	2	3.37
A. Recognize that all weeds are harmful to cotton.	46	101	21	4	0	0	3.10
1. Evaluate the economic impact of weeds on returns.	16	22	4	1	0	0	3.23
2. Discuss the ways weeds are spread.	8	25	9	1	0	0	2.93
3. Identify grasses infesting cotton.	11	27	4	1	0	0	3.12

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
4. Identify broadleaf plants infesting cotton.	11	27	4	1	0	0	3.12
B. Evaluate mechanical and cultural weed control.	*44*	*70*	*15*	*0*	*0*	*0*	*3.22*
1. Identify methods of mechanical and cultural weed control.	13	27	3	0	0	0	3.23
2. Appraise the performance of mechanical and cultural weed control methods.	11	27	5	0	0	0	3.14
3. Rate methods of mechanical and cultural weed control in terms of expected economic costs and returns.	20	16	7	0	0	0	3.30
C. Evaluate chemical weed control.	*88*	*70*	*12*	*2*	*0*	*0*	*3.42*
1. Recognize approved herbicides.	27	14	2	0	0	0	3.58
2. Appraise the performance of recommended herbicides.	20	19	4	0	0	0	3.37
3. Recognize effect of herbicide carry-over characteristics in soil.	22	17	3	1	0	0	3.40
4. Rate recommended herbicides in terms of expected economic costs and returns.	19	20	3	1	0	0	3.33
D. Plan a weed control program.	*66*	*49*	*10*	*2*	*0*	*2*	*3.41*
1. Compare weed control methods.	17	19	5	0	0	2	3.29
2. Recognize weed infestations and select a mechanical and/or cultural and/or chemical weed control program.	22	17	3	1	0	0	3.33
3. Select appropriate chemical for the job.	27	13	2	1	0	0	3.53
E. Apply a weed control program.	*180*	*107*	*11*	*3*	*0*	*0*	*3.54*
1. Operate mechanical weed control equipment, herbicide application equipment, incorporation equipment, and power sources safely.	24	16	2	1	0	0	3.47
2. Maintain, adjust, and be able to perform field repair on mechanical weed control equipment and power sources.	15	24	4	0	0	0	3.26
3. Maintain, adjust, calibrate, and be able to perfrom field repair on herbicide application equipment.	24	18	0	1	0	0	3.51

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
4. Mix recommended cotton herbicides conforming to manufacturer's label directions.	31	10	1	1	0	0	3.65
5. Comply with manufacturer's label directions and legal requirements affecting timing of recommended cotton herbicide application.	29	12	2	0	0	0	3.63
6. Apply or arrange for application of recommended cotton herbicides according to manufacturer's label directions.	29	13	1	0	0	0	3.65
7. Recognize dangers of carry-over of chemical residues in the soil and in application equipment.	28	14	1	0	0	0	3.63
VII. Controlling Insects	*262*	*346*	*62*	*10*	*7*	*1*	*3.23*
A. Determine the degree of insect threat.	*33*	*51*	*1*	*1*	*0*	*0*	*3.35*
1. Identify mature and immature forms of harmful and beneficial insects.	20	23	0	0	0	0	3.47
2. Select and utilize methods of anticipating development of harmful insects.	13	28	1	1	0	0	3.23
B. Evaluate cultural insect control methods.	*26*	*82*	*16*	*4*	*1*	*0*	*2.99*
1. Appraise performance of cultural insect control practices.	9	29	4	1	0	0	3.07
2. Evaluate the performance of sex attractants and traps for insect control in cotton.	8	25	8	1	1	0	2.88
3. Select methods of cultural insect control in terms of expected economic costs and returns.	9	28	4	2	0	0	3.02
C. Evaluate chemicals for insect control.	*31*	*45*	*8*	*1*	*0*	*1*	*3.25*
1. Appraise performance of recommended insecticides.	14	23	4	1	0	1	3.19
2. Select insecticide in terms of expected economic costs and returns.	17	22	4	0	0	0	3.30
D. Plan an insect control program.	*47*	*64*	*15*	*3*	*0*	*0*	*3.20*
1. Develop a procedure for detection.	20	19	3	1	0	0	3.35

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
2. Compare cultural and chemical insect control methods.	12	23	7	1	0	0	3.07
3. Calculate costs and returns of a program to control insects.	15	22	5	1	0	0	3.19
E. Apply insect control program.	*125*	*104*	*22*	*1*	*6*	*0*	*3.32*
1. Operate insecticide application equipment and power sources safely.	22	14	5	0	2	0	3.26
2. Maintain, adjust, calibrate, and perform field repair on insecticide equipment.	15	22	4	0	2	0	3.12
3. Mix recommended cotton insecticides conforming to manufacturer's label directions.	23	15	3	0	2	0	3.33
4. Comply with manufacturer's label directions and legal requirements affecting timing of recommended cotton insecticide application.	23	14	5	1	0	0	3.37
5. Apply or arrange for application of recommended cotton insecticides according to manufacturer's label directions.	20	20	3	0	0	0	3.40
6. Recognize dangers of carry-over of chemical residues in application equipment.	22	19	2	0	0	0	3.47
VIII. Controlling Diseases	*172*	*399*	*115*	*35*	*0*	*10*	*2.98*
A. Recognize disease symptoms.	*25*	*108*	*31*	*8*	*0*	*0*	*2.87*
1. Evaluate the economic impact of diseases on returns.	8	26	7	2	0	0	2.93
2. Explain the ways in which diseases are spread.	6	27	9	1	0	0	2.88
3. Identify symptoms of harmful diseases.	7	29	5	2	0	0	2.95
4. Name diseases infecting cotton.	4	26	10	3	0	0	2.72
B. Evaluate cultural disease control methods.	*10*	*57*	*16*	*1*	*0*	*2*	*2.90*
1. Describe practices considered beneficial in disease control programs.	5	28	8	1	0	1	2.88
2. Compare the effectiveness of cultural practices in controlling diseases.	5	29	8	0	0	1	2.93

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
C. *Evaluate chemical disease control.*	*27*	*72*	*20*	*8*	*0*	*2*	*2.93*
1. Recognize approved fungicides.	9	23	7	4	0	0	2.86
2. Appraise the performance of recommended fungicides.	8	26	5	2	0	2	2.98
3. Select recommended fungicides in terms of expected economic costs and returns.	10	23	8	2	0	0	2.95
D. *Plan a disease control program.*	*16*	*42*	*21*	*6*	*0*	*1*	*2.80*
1. Compare cultural and chemical disease control methods.	6	23	11	3	0	0	2.74
2. Calculate costs and returns of program to control problem diseases.	10	19	10	3	0	1	2.86
E. *Apply a disease control program.*	*94*	*120*	*27*	*12*	*0*	*5*	*3.17*
1. Operate fungicide application equipment and power sources safely.	18	18	3	3	0	1	3.21
2. Maintain, adjust, calibrate, and be able to perform field repair on fungicide application equipment.	17	19	5	2	0	0	3.19
3. Mix recommended cotton fungicides conforming to manufacturer's label directions.	17	19	4	2	0	1	3.21
4. Comply with manufacturer's label directions and legal requirements affecting timing of recommended cotton fungicide application.	20	15	4	1	0	3	3.35
5. Apply or arrange for application of recommended cotton fungicides according to manufacturer's label directions.	10	26	5	2	0	0	3.02
6. Recognize dangers of chemical carryover in disease control equipment.	12	23	6	2	0	0	3.05
IX. *Irrigating*	*136*	*274*	*112*	*35*	*40*	*5*	*2.72*
A. *Plan an irrigation program.*	*78*	*169*	*79*	*28*	*30*	*3*	*2.62*
1. Compare amount and timing of rainfall to determine whether preirrigation, irrigation, or controlled supplemental irrigation is needed.	11	17	8	3	4	0	2.65
2. Appraise the effects of moisture on quantity and quality.	9	20	7	4	3	0	2.65

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
3. Anticipate production problems caused by irrigation water.	11	20	6	3	3	0	2.76
4. Evaluate fertilizer application through irrigation water.	9	18	9	3	4	0	2.58
5. Evaluate soil amendments used to aid water penetration.	5	18	13	4	3	0	2.42
6. Compare types of irrigation systems.	6	21	10	3	3	0	2.56
7. Compute costs of irrigation systems.	7	19	11	3	3	0	2.56
8. Calculate added costs and returns from irrigation.	9	21	7	3	3	0	2.70
9. Comply with legal requirements concerning irrigation.	11	15	8	2	4	3	2.68
B. *Apply irrigation.*	*58*	*105*	*33*	*7*	*10*	*2*	*2.91*
1. Operate irrigation equipment safely.	12	20	7	2	2	0	2.88
2. Maintain, adjust, and be able to perform field repair on irrigation equipment.	8	23	7	2	2	1	2.79
3. Recognize soil and plant conditions indicating irrigation is needed.	14	20	6	1	2	0	3.00
4. Determine amount of and time for applying irrigation for the most economic production.	13	18	8	1	2	1	2.93
5. Control water distribution over the field.	11	24	5	1	2	0	2.95
X. *Defoliating*	*184*	*217*	*43*	*7*	*8*	*14*	*3.22*
A. *Calculate the cost of and returns from defoliation.*	*19*	*53*	*8*	*4*	*1*	*1*	*3.00*
1. Evaluate the advantage of chemical defoliation verses natural defoliation.	10	28	3	1	1	0	3.05
2. Compute the cost of chemical defoliation.	9	25	5	3	0	1	2.95
B. *Determine when to defoliate.*	*29*	*49*	*7*	*1*	*0*	*0*	*3.23*
1. Recognize the growth stage of a cotton plant that is ready to defoliate.	18	23	2	0	0	0	3.37
2. Anticipate possibility of inclement weather that would affect defoliation time.	11	26	5	1	0	0	3.09

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
C. *Select materials for defoliation.*	*10*	*16*	*4*	*1*	*0*	*12*	3.13
D. *Apply defoliants.*	*126*	*99*	*24*	*1*	*7*	*1*	3.31
1. Operate defoliation application equipment and power sources safely.	19	18	4	0	2	0	3.21
2. Maintain, adjust, calibrate, and perform field repair on defoliation equipment.	18	17	6	0	2	0	3.14
3. Mix recommended cotton defoliants conforming to manufacturer's label directions.	25	13	3	0	2	0	3.37
4. Comply with manufacturer's label directions and legal requirements affecting timing of recommended cotton defoliant application.	26	13	3	0	1	0	3.47
5. Apply or arrange for application of recommended cotton defoliants according to manufacturer's label directions.	18	21	4	0	0	0	3.33
6. Recognize dangers of carry-over of chemical residues in application equipment.	20	17	4	1	0	1	3.33
XI. *Harvesting*	*108*	*161*	*24*	*7*	*0*	*1*	3.23
A. *Determine time to harvest.*	*42*	*69*	*14*	*3*	*0*	*1*	3.17
1. Coordinate time of harvest with time of defoliation.	17	21	3	1	0	1	3.29
2. Recognize climatic conditions essential for maximum harvest efficiency.	14	22	5	2	0	0	3.12
3. Anticipate weather conditions in local area.	11	26	6	0	0	0	3.12
B. *Select a harvesting and storage method.*	*17*	*55*	*10*	*4*	*0*	*0*	2.99
1. Compare available harvest and storage methods.	7	29	4	3	0	0	2.86
2. Calculate expected costs and returns of custom verses farm owned harvest and storage equipment.	10	26	6	1	0	0	3.05
C. *Operate harvest and storage equipment.*	*49*	*37*	*0*	*0*	*0*	*0*	3.57
1. Safely operate cotton harvest equipment, storage equipment, and power sources.	27	16	0	0	0	0	3.63

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
2. Adjust, maintain, and perform field repair on cotton harvest and storage equipment.	22	21	0	0	0	0	3.51
XII. Selecting a Gin	*24*	*100*	*38*	*9*	*0*	*1*	*2.81*
A. Evaluate efficiency of available ginning facilities.	*15*	*43*	*22*	*5*	*0*	*1*	*2.80*
1. Compare grades of equivalent cotton ginned at various places.	9	22	10	2	0	0	2.88
2. Compare pounds of lint from samples of cotton ginned at various places.	6	21	12	3	0	1	2.71
B. Select a gin based on net returns from ginning.	*9*	*57*	*16*	*4*	*0*	*0*	*2.83*
1. Compare transportation costs.	6	25	10	2	0	0	2.81
2. Evaluate convenience of available ginning facilities.	3	32	6	2	0	0	2.84
XIII. Recognizing Cotton Classes	*45*	*152*	*72*	*29*	*2*	*1*	*2.70*
A. Recognize the value of lint cotton.	*18*	*65*	*32*	*13*	*1*	*0*	*2.67*
1. Describe color characteristics.	6	22	10	5	0	0	2.67
2. Estimate staple length.	6	20	11	5	1	0	2.58
3. Compare and evaluate methods of ginning.	6	23	11	3	0	0	2.74
B. Evaluate the character of cotton.	*27*	*87*	*40*	*16*	*1*	*1*	*2.72*
1. Interpret results of the micronaire.	8	22	10	3	0	0	2.81
2. Compare results of tensile strength measurements.	5	20	12	5	1	0	2.53
3. Recognize uniformity of staple.	5	25	7	6	0	0	2.67
4. Calculate maturity.	9	20	11	2	0	1	2.86
XIV. Marketing	*71*	*113*	*54*	*17*	*0*	*3*	*2.93*
A. Evaluate market news information.	*27*	*37*	*16*	*4*	*0*	*2*	*3.04*
1. Compare prices from various markets.	14	20	7	2	0	0	3.07
2. Calculate the differences between quoted prices and the cotton raised.	13	17	9	2	0	2	3.00
B. Evaluate the government program.	*24*	*36*	*20*	*5*	*0*	*1*	*2.93*
1. Calculate the government loan price.	11	18	10	3	0	1	2.88
2. Secure proper forms from the Agricultural Stabilization and Conser-							

(Table No. 1, cont.)

Duties,* General Competencies,** and Specific Competencies***	Relative Importance						Weighted Mean
	Essential	Important	Of Some Importance	Not Important	Does Not Apply	Did Not Respond	
vation Service for compliance with	13	18	10	2	0	0	2.98
C. *Sell cotton.*	*20*	*40*	*18*	*8*	*0*	*0*	*2.84*
1. Consider transportation charges.	9	20	10	4	0	0	2.97
2. Evaluate compress and storage charges.	11	20	8	4	0	0	2.88
XV. *Analyzing Production*	*76*	*107*	*22*	*10*	*0*	*0*	*3.16*
A. *Calculate profuts from production.*	*21*	*15*	*5*	*2*	*0*	*0*	*3.28*
1. Summarize crop year production records.	21	15	5	2	0	0	3.28
B. *Analyze future production.*	*55*	*92*	*17*	*8*	*0*	*0*	*3.13*
1. Evaluate future production forecast.	12	24	5	2	0	0	3.07
2. Evaluate future demand predictions.	12	24	5	2	0	0	3.07
3. Calculate anticipated profits from future production.	14	23	4	2	0	0	3.14
4. Determine the role of cotton production in your farming program.	17	21	3	2	0	0	3.23

Table No. 2, page 19, is a rank order of relative importance of one hundred fifty-eight specific competencies and 2 general competencies for cotton production with the weighted mean for each. The 2 general competencies are included because no specific competencies were developed for them; thus the independent general competencies in this case can be viewed as specific competencies. It should be noted that neither of the general competencies had responses in the "does not apply" catagory, indicating that those general competencies are useful as specific competencies in ranking relative importance.

Table No. 2. Rank Order of 158 Specific Competencies and 2 *Independent General Competencies* for Cotton Production.

Rank	Specific Competency or *General Competency* No.	Specific or *General* Competency	Weighted Mean
1	V. C. 4.	Adjust planter for depth of planting.	3.70
2.	VI. E. 4.	Mix recommended cotton herbicides conforming to manufacturer's label directions.	3.65
3	VI. E. 6.	Apply or arrange for application of recommended cotton herbicides according to manufacturer's label directions.	3.56
4	VI. E. 5.	Comply with manufacturer's label directions and legal requirements affecting timing of recommended cotton herbicide application.	3.63
5	VI. E. 7.	Recognize dangers of carry-over of chemical residues in the soil and in application equipment.	3.63
6	XI. C. 1.	Safely operate cotton harvest equipment, storage equipment, and power sources.	3.63
7	VI. C. 1.	Recognize approved herbicides.	3.58
8	V. C. 2.	Determine the depth of planting in regard to environmental conditions.	3.57
9	VI. D. 3.	Select appropriate chemical for job.	3.53
10	III. D. 1.	Calibrate fertilizer application equipment.	3.51
11	IV. C. 1.	Select the variety best adapted to conditions.	3.51
12	VI. E. 3.	Maintain, adjust, calibrate, and be able to perform field repair on herbicide application equipment.	3.51
13	XI. C. 2.	Adjust, maintain, and perform field repair on cotton harvest and storage equipment.	3.51
14	II. C. 2.	Operate crop residue disposal equipment, plowing equipment, and power sources safely.	3.49
15	V. C. 5.	Operate planting equipment and power sources safely.	3.49
16	II. A. 1.	Recognize land possessing physical conditions, native fertility, and topography suitable for cotton production.	3.47
17	II. C. 3.	Maintain, adjust, and be able to perform field repair on crop residue disposal equipment, plowing equipment, and power sources.	3.47
18	VI. E. 1.	Operate mechanical weed control equipment, herbicide application equipment, incorporation equipment, and power sources safely.	3.47
19	VII. A. 1.	Identify mature and immature forms of harmful and beneficial insects.	3.47
20	VII. E. 6.	Recognize dangers of carry-over of chemical residues in application equipment.	3.47
21	X. D. 4.	Comply with manufacturer's label directions and legal requirements affecting timing of reco-	

(Table No. 2, cont.)

Rank	Specific Competency or *General Competency* No.	Specific or *General* Competency	Weighted Mean
		mmended cotton defoliant application.	3.47
22	III. D. 2.	Operate fertilizer application equipment and power sources safely.	3.44
23	V. A. 1.	Describe and recognize characteristics of a cotton seedbed.	3.44
24	V. C. 3.	Adjust planter to determined row width.	3.44
25	V. A. 3.	Operate tillage equipment and power sources safely.	3.42
26	V. B. 3.	Recognize moisture conditions essential at planting time.	3.42
27	III. A. 2.	Take soil samples.	3.40
28	V. C. 1.	Determine the row width for planting.	3.40
29	VI. C. 3.	Recognize effect of herbicide carry-over characteristics in soil.	3.40
30	VII. E. 5.	Apply or arrange for application of recommended cotton insecticides according to manufacturer's label directions.	3.40
31	VI. C. 2.	Appraise the performance of recommended herbicides.	3.37
32	VII. E. 4.	Comply with manufacturer's label directions and legal requirements affecting timing of recommended cotton insecticide application.	3.37
33	X. B. 1.	Recognize the growth stage of a cotton plant that is ready to defoliate.	3.37
34	X. D. 3.	Mix recommended cotton defoliants conforming to manufacturer's label directions.	3.37
35	VII. D. 1.	Develop a procedure for detection.	3.35
36	VII. E. 4.	Comply with manufacturer's label directions and legal requirements affecting timing of recommended cotton fungicide application.	3.35
37	III. D. 3.	Maintain, adjust, and be able to perform field repair on fertilizer application equipment and power sources.	3.33
38	V. C. 6.	Maintain, and be able to perform field repair on planter.	3.33
39	VI. C. 4.	Rate recommended herbicides in terms of expected economic costs and returns.	3.33
40	VI. D. 2.	Recognize weed infestations and select a mechanical and/or cultural and/or chemical weed control program.	3.33
41	VII. E. 3.	Mix recommended cotton insecticides conforming to manufacturer's label directions.	3.33
42	X. D. 5.	Apply or arrange for application of recommended cotton defoliants according to manufacturer's label directions.	3.33

(Table No. 2, cont.)

Rank	Specific Competency or *General Competency* No.	Specific or *General* Competency	Weighted Mean
43	X. D. 6.	Recognize dangers of carry-over of chemical residues in application equipment.	3.33
44	V. A. 4.	Maintain, adjust, and be able to perform field repair on tillage equipment and power sources.	3.30
45	VI. B. 3.	Rate methods of mechanical and cultural weed control in terms of expected economic costs and returns.	3.30
46	VII. C. 2.	Select insecticide in terms of expected economic costs and returns.	3.30
47	II. C. 1.	Compare methods of plowing land and select the method of plowing.	3.29
48	VI. D. 1.	Compare weed control methods.	3.29
49	XI. A. 1.	Coordinate time of harvest with time of defoliation.	3.29
50	V. A. 2.	Compare methods of seedbed preparation.	3.28
51	XV. A. 1.	Summarize crop year production record.	3.27
52	VI. E. 2.	Maintain, adjust, and be able to perform field repair on mechanical weed control equipment and power sources.	3.26
53	VII. E. 1.	Operate insecticide application equipment and power sources safely.	3.26
54	VI. A. 1.	Evaluate the economic impact of weeds on returns.	3.23
55	VI. B. 1.	Identify methods of mechanical and cultural weed control.	3.23
56	VII. A. 2.	Select and utilize methods of anticipating development of harmful insects.	3.23
57	XV. B. 4.	Determine the role of cotton production in your farming program.	3.23
58	II. B. 1.	Explain the influence crop residue disposal and moisture conditions has on the time to plow land.	3.21
59	III. A. 5.	Evaluate the effect of fertilizer placement on yield responses.	3.21
60	III. C. 1.	Calculate and compare costs per unit of nutrient from available fertilizer sources.	3.21
61	IV. B. 1.	Determine the varieties adapted to local conditions.	3.21
62	VII. E. 1.	Operate fungicide application equipment and power sources safely.	3.21
63	VII. E. 3.	Mix recommended cotton fungicides conforming to manufacturer's label directions.	3.21
64	X. D. 1.	Operate defoliation application equipment and power sources safely.	3.21
65	II. A. 3.	Develop crop rotation or crop alternation plan for soil building and for soil sanitation.	3.19

(Table No. 2, cont.)

Rank	Specific Competency or *General Competency* No.	Specific or *General* Competency	Weighted Mean
66	III. A. 1.	List nutrient requirements for cotton production.	3.19
67	VII. C. 1.	Appraise performance of recommended insecticides.	3.19
68	VII. D. 3.	Calculate costs and returns of a program to control insects.	3.19
69	VIII. E. 2.	Maintain, adjust, calibrate, and be able to perform field repair on fungicide application equipment.	3.19
70	III. A. 3.	Interpret soil test results specifically for cotton production.	3.16
71	III. A. 4.	Compare costs of methods of fertilizer application.	3.16
72	IV. C. 2.	Compare quality of cotton seed.	3.16
73	III. A. 6.	Recognize nutrient deficiencies by visual observation of plant.	3.14
74	III. C. 2.	Calculate the most economic combination of cotton nutrient sources.	3.14
75	V. B. 2.	Appraise the performance of mechanical and cultural weed control methods.	3.14
76	X. D. 2.	Maintain, adjust, calibrate, and perform field repair on defoliation equipment.	3.14
77	XV. B. 3.	Calculate anticipated profits from future production.	3.14
78	X. C.	*Select materials for defoliation.*	3.13
79	IV. C. 5.	Evaluate the effect of seed variety on yield responses.	3.12
80	V. B. 1.	Measure soil temperature to determine time to plant.	3.12
81	VI. A. 3.	Identify grasses infesting cotton.	3.12
82	VI. A. 4.	Identify broadleaf plants infesting cotton.	3.12
83	VII. E. 2.	Maintain, adjust, calibrate, and perform field repair on insecticide equipment.	3.12
84	XI. A. 2.	Recognize climatic conditions essential for maximum harvest efficiency.	3.12
85	XI. A. 3.	Anticipate weather conditions in local area.	3.12
86	X. B. 2.	Anticipate possibility of inclement weather that would affect defoliation time.	3.09
87	IV. B. 2.	Compare the characteristics of locally adapted varieties.	3.07
88	IV. C. 3.	Compare advantages and disadvantages of certified, locally produced or home saved seed.	3.07
89	VII. B. 1.	Appraise performance of cultural insect control methods.	3.07
90	VII. D. 2.	Compare cultural and chemical insect control methods.	3.07

(Table No. 2, cont.)

Rank	Specific Competency or *General Competency* No.	Specific or *General* Competency	Weighted Mean
91	XIV. A. 1.	Compare prices from various markets.	3.07
92	XV. B. 1.	Evaluate future production forecasts.	3.07
93	XV. B. 2.	Evaluate future demand predictions.	3.07
94	V. B. 2.	Compare early and late planting.	3.05
95	VIII. E. 6.	Recognize dangers of chemical carry-over in disease control equipment.	3.05
96	X. A. 1.	Evaluate the advantage of chemical defoliation verses natural defoliation.	3.05
97	XI. B. 2.	Calculate expected costs and returns of custom verses farm owned harvest and storage equipment.	3.05
98	VII. B. 3.	Select method of cultural insect control in terms of expected economic costs and returns.	3.02
99	VIII. E. 5.	Apply or arrange for application of recommended cotton fungicides according to manufacturer's label directions.	3.02
100	II. B. 2.	Comply with legal requirements and conditions regarding disposal of crop residues.	3.00
101	*III. B.*	*Compare yield results from using different sources of nutrients and soil amendments.*	*3.00*
102	IX. B. 3.	Recognize soil and plant conditions indicating irrigation is needed.	3.00
103	XIV. A. 2.	Calculate the differences between quoted prices and the cotton raised.	3.00
104	VIII. C. 2.	Appraise the performance of recommended fungicides.	2.98
105	XIV. B. 2.	Secure proper forms from the Agricultural Stabilization and Conservation Service for compliance with the government program.	2.98
106	IV. A. 1.	Identify plant characteristics.	2.95
107	VIII. A. 3.	Identify symptoms of harmful diseases.	2.95
108	VIII. C. 3.	Select recommended fungicides in terms of expected economic costs and returns.	2.95
109	IX. B. 5.	Control water distribution over the field.	2.95
110	X. A. 2.	Compute the cost of chemical defoliation.	2.95
111	I. 4.	Evaluate opportunities in cotton production.	2.93
112	IV. C. 6.	Arrange for treating and/or securing seed.	2.93
113	VI. A. 2.	Discuss the ways weeds are spread.	2.93
114	VIII. A. 1.	Evaluate the economic impact of diseases on returns.	2.93
115	VIII. B. 2.	Compare the effectiveness of cultural practices in controlling diseases.	2.93
116	IX. B. 4.	Determine amount of and time for applying irrigation for the most economic production.	2.93

(Table No. 2, cont.)

Rank	Specific Competency or *General Competency* No.	Specific or *General* Competency	Weighted Mean
117	II. B. 3.	Compare and select the method of crop residue disposal.	2.88
118	VII. B. 2.	Evaluate the performance of sex attractants and traps for insect control in cotton.	2.88
119	VIII. A. 2.	Explain the ways in which diseases are spread.	2.88
120	VIII. B. 1.	Describe practices considered beneficial in disease control programs.	2.88
121	IX. B. 1.	Operate irrigation equipment safely.	2.88
122	XII. A. 1.	Compare grades of equivalent cotton ginned at various places.	2.88
123	XIV. B. 1.	Calculate the government loan price.	2.88
124	XIV. C. 2.	Evaluate compress and storage charges.	2.88
125	VIII. C. 1.	Recognize approved fungicides.	2.86
126	VIII. D. 2.	Calculate costs and returns of program to control problem diseases.	2.86
127	XI. B. 1.	Compare available harvest and storage methods.	2.86
128	XIV. B. 4.	Calculate maturity.	2.86
129	XII. B. 2.	Evaluate convenience of available ginning facilities.	2.84
130	V. B. 4.	Study local weather conditions.	2.81
131	XII. B. 1.	Compare transportation costs.	2.81
132	XIII. B. 1.	Interpret results of the micronaire.	2.81
133	II. B. 4.	Compare advantages and disadvantages of fall and spring plowing.	2.79
134	IX. B. 2.	Maintain, adjust, and be able to perform field repair on irrigation equipment.	2.79
135	XIV. C. 1.	Consider transportation charges.	2.79
136	IV. C. 4.	Describe storage methods for saved seed.	2.77
137	IX. A. 3.	Anticipate production problems caused by irrigation water.	2.76
138	VIII. D. 1.	Compare cultural and chemical disease control methods.	2.74
139	XIII. A. 3.	Compare and evaluate methods of ginning.	2.74
140	I. 3.	Describe government policies that affect cotton production.	2.72
141	VIII. A. 4.	Name diseases infecting cotton.	2.72
142	IV. C. 7.	Explain effect of seed laws on seed selection.	2.71
143	XII. A. 2.	Compare pounds of lint from samples of cotton ginned at various places.	2.71
144	IX. A. 8.	Calculate added costs and returns from irrigation.	2.70
145	II. A. 2.	Analyze the effect the government cotton program has on land selected.	2.69

(Table No. 2, cont.)

Rank	Specific Competency or *General Competency* No.	Specific or *General* Competency	Weighted Mean
146	IX. A. 9.	Comply with legal requirements concerning irrigation.	2.68
147	XIII. A. 1.	Describe color characteristics.	2.67
148	XIII. B. 3.	Recognize uniformity of staple.	2.67
149	IX. A. 1.	Compare amount and timing of rainfall to determine whether pre-irrigation, irrigation, or controlled supplemental irrigation is needed.	2.65
150	IX. A. 2.	Appraise the effects of moisture on quantity and quality.	2.65
151	IX. A. 4.	Evaluate fertilizer application through irrigation water.	2.58
152	XIII. A. 2.	Estimate staple length.	2.58
153	IX. A. 6.	Compare types of irrigation systems.	2.56
154	IX. A. 7.	Compute costs of irrigation systems.	2.56
155	XIII. B. 2.	Compare results of tensile strength measurements.	2.53
156	IV. A. 3.	Explain environmental influence on fiber quality.	2.49
157	I. 2.	List the amount of production in the U.S. and the world.	2.43
158	IX. A. 5.	Evaluate soil amendments used to aid water penetration.	2.42
159	IV. A. 2.	Identify fiber properties.	2.31
160	I. 1.	Discuss the history of cotton.	2.20

It should be noted that the specific competencies developed and validated by this study serve as only one part of a much broader effort. As mentioned earlier, the specific competencies are fundamental elements used in developing a curriculum for cotton production. It was the intent of the National Agribusiness Manpower Project that the competencies developed for agribusiness occupations be used in curriculum development. This intent was expressed as the objective of "developing educational and training programs with appropriate curricula relevant to the needs of agribusiness".

Examples of curriculem materials developed to support one of the specific competencies for horse production are included as Appendix D of Employment

Opportunities and Training Needs in Agribusiness - Competencies for Horse Production. The examples of curriculum materials for horse production were chosen because of the greater emphasis on horse production throughout the United States.

Although not a part of the objectives of this study, it seemed evident that a possible outcome of the study could be a job description for entry and first advancement levels of employment in cotton production. The duties can be used to describe broadly those activities engaged in by cotton production employees. Appendix D is a job description for entry and first advancement level employees in cotton production. The reader is cautioned, however, that at present the cotton production industry lacks the formalized structure exsisting in other industries and governmental agencies. This structure has, through union agreements, production line technology, and government regulations, resulted in jobs being defined with great specificity. Many factors, such as geographical location and size of farm operation, in addition to the absence of a formalized structure, contribute to the wide variation in tasks performed by cotton production employees in cotton production. The reader is again cautioned that due to the wide variation in the cotton production industry, this job description may not be completely relevant for a particular individual or geographical location. An example would be the competencies relating to irrigation on a farm or in a geographical location that only raises dryland cotton.

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APPENDIX A

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APPENDIX B

Ten Leading Cotton Production
States and Responses from Each

Participants for the national validation phase of the study were identified as outstanding cotton producers by state directors of agricultural education in 9 of the ten leading states for cotton production. In addition to their leadership positions in cotton production these additional factors contributed to the selection of the states listed below:

1. These states are distributed throughout the United States Cotton Belt.

2. Their total production is the major portion of cotton produced in the United States.

3. Virtually all circumstances under which cotton can be grown in the United States are found in these states.

Ten Leading Cotton Producing States from the December 1974 Cotton Situation of the Agricultural Research Service - USDA

State	1000 Bales	Number of Responses
1. Texas	3126	14*
2. California	2350	3
3. Mississippi	1930	10
4. Arkansas	1300	4
5. Arizona	900	0
6. Louisiana	610	7
7. Alabama	570	3
8. Tennessee	420	2
9. Georgia	400	6
10. Oklahoma	320	8

*Number of members of the Texas advisory and validating committees

APPENDIX C

Rank Order of Cotton Production
Duties with Component General Competencies
Rank Ordered within the Duty

VI. Controlling Weeds
- E. Apply a weed control program.
- C. Evaluate chemical weed control.
- D. Plan a weed control program.
- B. Evaluate mechanical and cultural weed control.
- A. Recognize that all weeds are harmful to cotton.

V. Planting
- C. Adjust planter.
- A. Prepare seedbed for planting.
- B. Determine the time to plant on different type soils.

III. Selecting and Using Fertilizers and Soil Amendments
- D. Apply fertilizers.
- A. Determine cotton macro and micro nutrient requirements.
- C. Plan a fertility program using combinations of nutrient sources to be applied at designated times in specified amounts.
- B. Compare yield results from using different sources of nutrients and soil amendments.

VII. Controlling Insects
- A. Determine the degree of insect threat.
- E. Apply insect control program.
- C. Evaluate chemicals for insect control.
- D. Plan an insect control program.
- B. Evaluate cultural insect control methods.

XI. Harvesting
- C. Operate harvest and storage equipment.
- A. Determine time to harvest.
- B. Select a harvesting and storage method.

X. Defoliating
- D. Apply defoliants.
- B. Determine when to defoliate.
- C. Select material for defoliation.
- A. Calculate the cost of and returns from defoliation.

XV. Analyzing Production
- A. Calculate profits from production.
- B. Analyze future production.

II. Selecting and Preparing Soil for Cotton Production
- C. Plow the land.
- A. Select the land to use.
- B. Determine the time to plow land.

VIII. Controlling Diseases
- E. Apply a disease control program.
- C. Evaluate chemical disease control.
- B. Evaluate cultural disease control methods.
- A. Recognize disease symptoms.
- D. Plan a disease control program.

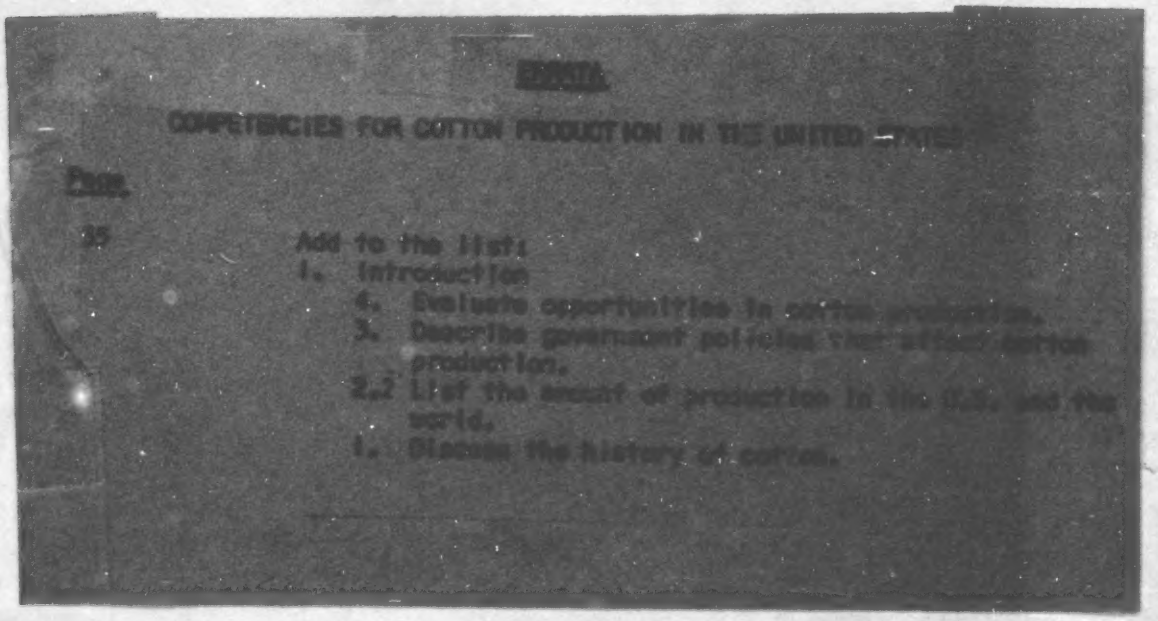
IV. Selecting the Variety and Obtaining Seed
- B. Evaluate characteristics of varieties.
- C. Select and secure seed.
- A. Recognize factors of variety selection.

XIV. Marketing
- A. Evaluate market news information.
- B. Evaluate government program.
- C. Sell cotton.

XII. Selecting a Gin
- B. Select a gin based on net returns from ginning.
- A. Evaluate efficiency of available ginning facilities.

IX. Irrigation
- B. Apply irrigation.
- A. Plan an irrigation program.

XIII. Recognize Cotton Classes
- B. Evaluate the character of cotton.
- A. Recognize the value of lint cotton.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COMPETENCIES FOR COTTON PRODUCTION IN THE UNITED [illegible]

From

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Add to the list:
1. Introduction
   4. Evaluate opportunities in cotton production.
   3. Describe government policies that affect cotton production.
   2. List the amount of production in the U.S. and the world.
   1. Discuss the history of cotton.

APPENDIX D

Cotton Production Job Description

Cotton Production Employee - Evaluates mechanical, cultural, and chemical weed control and plans and applies a weed control program. Determines macro and micro nutrient requirements, compares yield results from using different nutrient sources, plans a fertility program, and applies fertilizer. Determines degree of insect threat, compares cultural and chemical insect control, and plans and applies insect control program. Selects a harvesting and storage method, determines time to harvest, and operates harvest and storage equipment. Calculates costs and returns from defoliation, selects defoliation material, determines time to defoliate, and applies defoliant. Calculates profits and analyzes future production. Selects the land for planting, determines the time to plow, and plows the land. Recognizes disease symptoms, evaluates chemical and cultural disease control, and plans and applies a disease control program. Recognizes factors of variety selection, evaluates variety characteristics, and selects and secures seed. Evaluates the government program and market news and sells cotton. Evaluates ginning efficiency and selects a gin. Plans and applies an irrigation program. Evaluates the character of cotton and recognizes the value of lint cotton.

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